

BRYOCRUMIA, A NEW GENUS OF HYPNACEAE (MUSCI)

Lewis E. Anderson
Department of Botany
Duke University
Durham, N. C., 27706

In 1950, I found a few strands of a tiny but attractive moss intermingled with other mosses on wet vertical rocks under hemlocks [Tsuga canadensis (L.) Carr.] in a cool, shaded ravine in Whitewater Gorge, about 3 miles above the small village of Jocassee, Oconee County, South Carolina. Although distinctive and in good condition, the identity of the moss eluded me. In despair I sent it to the late Edwin B. Bartram for his opinion. He responded at once and suggested that it was an undescribed species of Glossadelphus Fleisch., urging me to describe it. Glossadelphus is a wide-ranging sub-tropical genus, most of its species ranging in Southeast Asia, Micronesia and Australasia. At that time three species were known from tropical North America, none remotely resembling the South Carolina plants, however. Inexperience and unfamiliarity with the group counseled me against describing it, so Bartram (1951) named it Glossadelphus andersonii.

Since the original collection it has been found along the Whitewater, Toxaway, and Horsepasture gorges in Jackson and Transylvania Counties, North Carolina, and Oconee and Pickens Counties, South Carolina, always sparsely intermingled with other mosses. It appears to be restricted to a high rainfall area (often exceeding 100 inches) of the Blue Ridge Escarpment, along the North and South Carolina boundary, where stream capture has forced the Blue Ridge Divide inland from the Scarp forming a semi-circular area which drains into the Atlantic Ocean. Billings and Anderson (1966) termed this area the South-eastern Blue Ridge Embayment. The area supports a large number of bryophytes of unusual phytogeographic significance. The type locality for Glossadelphus andersonii has since been destroyed by an impoundment, Lake Jocassee, which serves a nearby nuclear power plant. The moss can still be found, however, along the upper reaches of the embayment streams, principally in North Carolina.

In 1965, Howard Crum, in a paper reevaluating the systematic position of G. andersonii, transferred it to Taxiphyllum. Although I agreed that it did not rightfully belong in Glossadelphus, I felt strongly that it should not be placed in Taxiphyllum. We have carried on friendly but rather barbed arguments over the taxonomic position of this curious moss ever since.

Crum (1965) stated: "Contrary to the original description, the leaves are bluntly obtuse or sometimes rounded-obtuse but not rounded at the apex, and the leaf cells are not papillose at the apical angles, although occasionally, and with difficulty, one can find small thickenings at the cell ends which project slightly at back." This is correct except for the leaf apices, which, contrary to Crum, are indeed rounded at the apex in many leaves. Crum might have added that it also has foliose pseudoparaphyllia, which are characteristic of Taxiphyllum. He thought he saw a relationship to Taxiphyllum scalpellifolium (C. Muell.) Bartr., which ranges in Central America.

I have since confirmed the absence of papillae on the leaf cells by examining material under the SEM. The thickenings Crum referred to at the cell ends do indeed give the illusion of papillae, appearing under the light microscope as pellucid dots. Under the SEM, however, there is not the slightest suggestion of papillae. Contrary to Bartram's original description, therefore, the leaf cells are smooth, which eliminates Glossadelphus as an acceptable genus for the moss. This is especially true now, for Robinson (1974) has lecto-typified Glossadelphus by designating a species (Hypnum truncatulum C. Muell.) which has exceptionally prominent papillae on the backs of the leaves. Robinson removed from Glossadelphus the species with smooth leaves so that the genus now embraces only the species which Fleischer (1915-1922) grouped into section Colophyllum, specifically those with rounded to somewhat emarginate leaf apices and apical cells with more or less papillose projections of the cell walls. Since Bartram thought the South Carolina plants were papillose, it is easy to see why he saw a relationship with Glossadelphus. Robinson (l.c.) did not come to grips with Glossadelphus (Taxiphyllum) andersonii, content, apparently, to leave it where Crum (l.c.) had placed it, namely in Taxiphyllum.

Ireland (1969), however, in his elegant treatment of the Plagiiotheciaceae, excluded the species from Taxiphyllum, a position he still maintains (in litt.). Both Ireland (1969) and Iwatsuki (1970) segregate Taxiphyllum principally on the basis of the presence of foliose pseudoparaphyllia, in contrast to Isopterygium, in which the pseudoparaphyllia, if present, are filamentous. Robinson (1974) noted that although the broad pseudoparaphyllia of Taxiphyllum are distinct from those of Isopterygium, they are not always present and are not much different from those of many other pleurocarpous mosses. He defined Taxiphyllum as "...flattened with usually spreading lateral leaves and a vestigial double costa. In addition, most of the species have somewhat shortened apical cells and the leaf cells project on the upper ends abaxially. The alar cells provide a significant lack of differentiation." I would add

to this description the presence of pseudoparaphyllia, following Ireland and Iwatsuki.

Although *Glossadelphus andersonii* possesses foliose pseudoparaphyllia, they differ strikingly from those of plants embracing my concept of *Taxiphyllum*. Pseudoparaphyllia in the latter are much longer than wide and are mostly lanceolate, occasionally obtuse or somewhat rounded-obtuse. In *G. andersonii* they are about as broad as long, and broadly rounded at the apex. The leaves of *G. andersonii* are also slightly decurrent and the alar cells are slightly differentiated with several rows of rectangular cells. These features, coupled with the absence of papillae and the subtle differences in leaf areolation exclude *Taxiphyllum*. All of the genera in this relationship lack clear definition and we may be dealing with over-classification. Nevertheless, as matters stand now, the southeastern escarpment plants under discussion can not be comfortably assigned to *Isopterygium* or *Taxiphyllum*. It seems appropriate, therefore, to place them in a new genus, a disposition which also provides an amicable solution to a long-standing argument.

I am extremely pleased to associate this genus with the name of my long-time close friend and colleague, Howard Crum. It is a friendship that has, thanks to a pleasant atmosphere of good humor and fun, withstood the vicissitudes and trials of many years of close collaboration and association.

Bryocrumia gen. nov.

Sat gracilis, caespitosa, caespitibus depressis, viridis, vix nitida. Caulis repens, irregulariter ramosus, lax et complanate foliosus. Folia patentia, e basi contracta oblongo-ovata, obtusa vel late rotundata, margine plana, superne valde crenulata, inferne minutissime crenulata; cellulae superiores lineari-rhomboideae, chlorophyllosae, laeve, non papillosae, cellululis alaribus haud distinctis. Caetera ignota.

Plants small, bright to yellow-green, in thin, intricate, moderately shiny mats. Stems short, creeping, freely but irregularly branched; pseudoparaphyllia foliose, about as broad as long, broadly rounded at apex; branches horizontal, sometimes slightly tapered at the tips. Leaves not crowded, somewhat remote, erect to wide-spreading and moderately complanate, more widely-spreading when wet, elliptic or oblong-ovate, from a rather strongly contracted base, slightly decurrent, bluntly obtuse to broadly rounded at the apex, ecostate; margins plane, bluntly to sharply serrate in the

upper half, entire or sinuolate below; upper median cells oblong-rhomboidal, flexuose, about 10-25 μ m long and 5 μ m wide, greenish and somewhat obscure, smooth; apical cells shorter than the median cells; basal cells oblong, becoming shorter at the margins and forming an indistinct alar region of rectangular cells. Inflorescences and sporophytes unknown.

Bryocrumia andersonii (Bartr.) comb. nov.

Glossadelphus andersonii Bartr., Bryologist 54: 81, 1951.

Taxiphyllum andersonii (Bartr.) Crum, Bryologist 68: 220, 1965.

Specimens examined: SOUTH CAROLINA: Oconee County, moist vertical rock, cool ravine, hemlock-hardwood community, Lower Falls, Whitewater River, about 3 miles northwest of Jocassee, alt. 1500 ft., June 6, 1950, Lewis E. Anderson, 9237 (holotype, FH; isotype, DUKE); Pickens County, moist vertical rocks, narrow, wooded ravine, Eastatoe River, near Rocky Bottom, August 25, 1976, Lewis E. Anderson, 22,264a (DUKE). NORTH CAROLINA: Jackson County, wet rocks, intermixed with other mosses, shaded hemlock-hardwood cove, Upper Falls, Whitewater River, near Bohaynee, August 25, 1949, Lewis E. Anderson, 8652a; Transylvania County, moist rocks, edge of stream, escarpment gorge, Toxaway Creek, 8 miles southwest of Rosman, July 29, 1952, Lewis E. Anderson, 11,088a; wet rock faces, vertical narrows, East Fork, Thompson River, 5 miles southeast of Bohaynee, July 30, 1952, Lewis E. Anderson, 11,106a.

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